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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,409	09/28/2001	Vasanth Philomin	US010475 (702495)	4378

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EXAMINER

SHAH, UTPAL D

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/966,409

Applicant(s)

PHILOMIN ET AL.

Examiner

Utpal D. Shah

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Response to Amendment

1. The amendment received on 2/22/2005 has been entered in full. Currently claims 1-12 are pending in the application. Based on the amendment to the specification the objection to the specification has been withdrawn. In the light of the amendment made to claims 6 and 8 the rejection of claims made under 35 U.S.C. 112, second paragraph has been withdrawn.

Response to Arguments

2. Applicant's arguments filed 2/22/2005 have been fully considered but they are not persuasive. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the claims don't specify that the matching process cannot utilize object trajectory. As applicant claims "classifying said higher resolution image according to a classification method performed by the said trained classifier device".) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

3. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 recites the limitation "the two or more features" in line 6. There is insufficient antecedent basis for this limitation in the claim. With regard to claim 10, the metes and bounds of the term "two or more features" are not clear as currently recited in the claim. Although, the claims make repeated use of the term "two or more features", there does not appear to be a single mention of the term "two or more features" in the applicant's disclosure. Since it appears that this term may have been added to the claims unintentionally and/or erroneously, the examiner will disregard this term, for the purpose of examination, the claims will be interpreted as "probability with which belongs to class".

Appropriate action is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-6, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. ("Video-Based Online Face Recognition Using Identity Surfaces") in view of US patent 5,696,848 by Patti et al. (Patti).

In regards to claim 1, Li et al. ("Li") discloses training a classifier device for recognizing facial images, said classifier device being trained with input data associated with a full facial image (Sect. 3.3; Sect. 2). Li further discloses obtaining a plurality of probe images of a temporal sequence of images (Sect. 3.4); aligning each of said probe images with respect to each other (Sect. 2); and classifying according to a classification method performed by said trained classifier device (Sect. 3.4).

Li does not appear to expressly disclose combining said probe images to form a higher resolution image.

However, Patti discloses combining said probe images to form a higher resolution image. (col. 2, lines 47-52, Patti discloses combining successive images to form a high resolution image.)

Li & Patti are combinable because they are from the same field of endeavor i.e. both references are related to frames from a digitized video signal. (col. 1, lines 34-38)

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the Li with the teachings of Patti.

The motivation for doing so would have been to least reduce the blur and noise degradation.

Therefore, it would have been obvious to combine Li with Patti to obtain the invention as specified in claim 1.

9. In regards to claims 11 and 12, the arguments analogous to those presented above for claim 1 are applicable to claims 11 and 12.

10. In regards to claim 2, Li and Patti disclose all the claimed limitations of claim 1, as discussed above in paragraph 8 and incorporated herein by the reference.

Li further discloses each face is oriented differently in each probe image (Figure 4).

11. In regards to claim 3, Li and Patti disclose all the claimed limitations of claim 1, as discussed above in paragraph 7 and incorporated herein by the reference.

Li further discloses the probe images are warped slightly with respect to each other so that they are aligned (Sect. 2).

12. In regards to claim 4, Li and Patti disclose all the claimed limitations of claim 3, as discussed above in paragraph 11 and incorporated herein by the reference.

Li further discloses automatically extracting successive face images from a

test sequence from the output of a face detection algorithm (Sect. 3.2, para. 3).

13. In regards to claim 5, Li and Patti disclose all the claimed limitations of claim 3, as discussed above in paragraph 11 and incorporated herein by the reference.

Li further discloses orientating each probe image and warping each image onto a frontal view of the face (Sect. 2; Sect. 4).

14. In regards to claim 6, Li and Patti disclose all the claimed limitations of claim 5, as discussed above in paragraph 13 and incorporated herein by the reference.

Li further discloses finding a head pose of detected partial view, defining a generic head model and rotating the generic head model so that it has the same orientation as the given face image; translating and scaling the generic head model so that one or more features of the generic head model coincide with the given face image; and recreating said image to obtain a frontal view of the face (Figure 1; Sect. 2).

15. Claims 7-10 rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. ("Video-Based Online Face Recognition Using Identity Surfaces") in view of US patent 5,696,848 by Patti et al. (Patti) as applied to claim 1 above in paragraph 8, and further in view of Gutta et al. ("Mixture of Experts for Classification of Gender, Ethnic Origin, and Pose of Human Faces").

In regards to claim 7, Li and Patti disclose all the claimed limitations of claim 1, as discussed above in paragraph 8 and incorporated herein by the reference.

Li and Patti do not disclose implementing a Radial Basis Function Network.

However, Gutta et al. ("Gutta") discloses a classifying step implementing a Radial Basis Function Network trained for classifying inputs based on facial images (pages 948-951; Sects. I-IV).

Li with Patti and Gutta are combinable because they are from the same field of endeavor of face recognition. (title)

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Li and Patti the teaching of Gutta.

The motivation for doing so would have been to increase the accuracy of the face recognition process (Page 957-958, Sect. VIII).

Therefore, it would have been obvious to combine Li and Patti with Gutta to obtain the invention as specified in claim 7.

16. In regards to claim 8, Li and Patti disclose all the claimed limitations of claim 6, as discussed above in paragraph 14 and incorporated herein by the reference.

Further, the arguments analogous to those presented above for claim 7 are applicable to claim 8. Gutta discloses:

- (a) initializing a Radial Basis Function Network, the initializing step comprising the steps of: fixing the network structure by selecting a number of basis functions F , where each basis function I has the output of a Gaussian non-linearity; determining the basis function means μ_I , where $I=1, \dots, F$, using a K-means clustering algorithm; determining the basis function variances σ_I^2 ; and

- determining a global proportionality factor H , for the basis function variances by empirical search (Pages 950-952; Sect. IV);
- (b) presenting the training, the presenting step comprising the steps of: inputting training patterns $X(p)$ and their class labels $C(p)$ to the classification method, where the pattern index is $p=1, \dots, N$; computing the output of the basis function nodes $y_i(p)$, F , resulting from pattern $X(p)$; computing the $F \times F$ correlation matrix R of the basis function outputs; and computing the $F \times M$ output matrix B , where d_j is the desired output and M is the number of output classes and $j=1, \dots, M$ (Pages 950-952; Sect. IV);
- (c) determining the weights, the determining step comprising the steps of: inverting the $F \times F$ correlation matrix R to get R^{-1} ; and solving for the weights in the network (Pages 950-952; Sect. IV).

17. In regards to claim 9, Li and Patti and Gutta disclose all the claimed limitations of claim 8, as discussed above in paragraph 16 and incorporated herein by the reference.

Further, the arguments analogous to those presented above for claim 7 are applicable to claim 9. Gutta disclose classifying a face image by computing the basis function outputs, for all F basis functions; computing output node activations; and selecting the output z_j with the largest value and classifying the image as a class j (Pages 950-952; Sect. IV). Note, the combination of Li and Patti and Gutta disclose the step of presenting an unknown higher resolution image from the temporal sequence to the classification method.

18. In regards to claim 10, Li and Patti disclose all the claimed limitations of claim 1, as discussed above in paragraph 8 and incorporated herein by the reference.

Further, the arguments analogous to those presented above for claim 7 are applicable to claim 10. Gutta discloses outputting a class label identifying a class to which the higher resolution image corresponds and a probability value indicating the probability with which the higher resolution image belongs to the class for each of two or more features (Pages 950-953; Sect. IV).

Contact Information

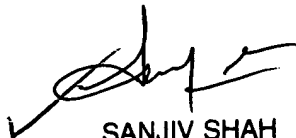
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Utpal D. Shah whose telephone number is 571-272-8568. The examiner can normally be reached on M-F (9 AM - 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-272-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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